

Figure 1

Tomato Leaf DHS cDNA sequence

19 ID 1 NT
19 ID 2 AA

CGCAGAACTCGCGGCGGCAGTCTTGTTCGGTACATAATCTTGGTCTGCAATAATGGGAGAAGCTCTGAAGTACAGTATCATGGAC
M G E A L K Y S I M D
TCAGTAAGATCGGTAGTTTTCAAAGAATCCGAAAATCTAGAAGGTTCTTGCACTAAAATCGAGGGCTACGACTTCAATAAAGGCGT
S V R S V V F K E S E N L E G S C T K I E G Y D F N K G V
TAACTATGCTGAGCTGATCAAGTCCATGGTTTCCACTGGTTTCCAAGCATCTAATCTTGGTGACGCCATTGCAATTGTTAATCAAA
N Y A E L I K S M V S T G F Q A S N L G D A I A I V N Q
TGCTAGATTGGAGGCTTTCACATGAGCTGCCACGGAGGATTGCAGTGAAGAAGAAAGAGATGTTGCATACAGAGAGTCCGTAACC
M L D W R L S H E L P T E D C S E E E R D V A Y R E S V T
TGCAAAATCTTCTGGGGTTCACTTCAAACCTTGTTCCTTCTGGTGTAGAGACACTGTCCGCTACCTTGTTCAGCACCGGATGGT
C K I F L G F T S N L V S S G V R D T V R Y L V Q H R M V
TGATGTTGTGGTTACTACAGCTGGTGGTATTGAAGAGGATCTCATAAAGTGCCTCGCACCAACCTACAAGGGGACTTCTCTTTAC
D V V V T T A G G I E E D L I K C L A P T Y K G D F S L
CTGGAGCTTCTCTACGATCGAAAGGATTGAACCGTATTGGTAACCTATTGGTTCTAATGACAACTACTGCAAAATTTGAGAATTGG
P G A S L R S K G L N R I G N L L V P N D N Y C K F E N W
ATCATCCCAGTTTTGGACAAATGTATGAGGAGCAGATTAATGAGAAGGTTCTATGGACACCATCTAAAGTCATTGCTCGTCTGGG
I I P V F D Q M Y E E Q I N E K V L W T P S K V I A R L G
TAAAGAAATTAATGATGAAACCTCATACTTGTATTGGGCTTACAAGAACCGGATTCTGTCTTCTGTCTGGCTTGGAGGATGGAT
K E I N D E T S Y L Y W A Y K N R I P V F C P G L T D G
CACTTGGTGACATGCTATACTTCCATTCTTTCAAAAAGGGTGATCCAGATAATCCAGATCTTAATCCTGGTCTAGTCATAGACATT
S L G D M L Y F H S F K K G D P D N P D L N P G L V I D I
GTAGGAGATATTAGGGCCATGAATGGTGAAGCTGTCCATGCTGGTTTGAGGAAGACAGGAATGATTATACTGGGTGGAGGGCTGCC
V G D I R A M N G E A V H A G L R K T G M I I L G G G L P
TAAGCACCATGTTTGAATGCCAATATGATGCGCAATGGTGCAGATTTTGCCGCTTTCATTAAACACCGCACAAAGAGTTTGATGGTA
K H H V C N A N M M R N G A D F A V F I N T A Q E F D G
GTGACTCTGGTGCCCGTCTGATGAAGCTGTATCATGGGGAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCA
S D S G A R P D E A V S W G K I R G G A K T V K V H C D A
ACCATTGCATTTCCCATATTAGTAGCTGAGACATTGTCAGCTAAGAGTAAGGAATTCTCCAGATAAGGTGCCAAGTTTGAACATT
T I A F P I L V A E T F A A K S K E F S Q I R C Q V
GAGGAAGCTGTCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACCTGCTAGTGTGCAGCACCATTATTTCTGCAAAA
CTGACTAGAGAGCAGGGTATATTCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTATTTTCTCCCTTCACA
CCATGTTATTTAGTTCTCTCTCTCGAAAGTGAAGAGCTTAGATGTTTCATAGGTTTGAATTATGTTGGAGGTTGGTGATAACT
GACTAGTCCTCTTACCATATAGATAATGTATCCTGTACTATGAGATTTTGGGTGTGTTTGATACCAAGGAAAAATGTTTATTG
AAAACAATTGGATTTTAAATTTATTTTCTTGTTTAAAAA

097250196T052650

Arabidopsis DeoxyHypusine Synthase (DHS) Predicted Sequence

Figure 2A

seq 5 = NT

GAAC TCCCAA ACCCTCTACTACTACACTTTTCAGATCCAAGGAAATCAATTTTGTCAATTCGAGCAACATGG
M
AGGATGATCGTGT TTTCTCTTCGGTTCAC TCAACAGTTTTCAAAGAATCCGAATCATTGGAAGGAAAGTGT
E D D R V F S S V H S T V F K E S E S L E G K C
GATAAAATCGAAGGATACGATTTCATCAAGGAGTAGATTACCCAAAGCTTATGCGATCCATGCTCACCAC
D K I E G Y D F N Q G V D Y P K L M R S M L T T
CGGATTTCAAGCCTCGAATCTCGGCGAAGCTATTGATGTCGTCATCAATCAAATGGTTCGTTTCTCGAATTCAT
G F Q A S N L G E A I D V V N Q M
CAAAAATAAAATTCCTTCTTTTGT TTTTCTTTTGT TTTTGGGTGAATTAGTAATGACAAAGAGTTTGAATT
F E F
TGTATTGAAGCTAGATTGGAGACTGGCTGATGAACTACAGTAGCTGAAGACTGTAGTGAAGAGGAGAAGA
V L K L D W R L A D E T T V A E D C S E E E K
ATCCATCGTTTAGAGAGTCTGTCAAGTGTAATCTTTCTAGGTTTCACTTCAAATCTTGTTCATCTGGT
N P S F R E S V K C K I F L G F T S N L V S S G
GTTAGAGATACTATTCTGTTATCTTGTTCAGCATCATATGGTTTGTGATTTTGTCTTTATCACCTGCTTTT
V R D T I R Y L V Q H H M
TTATAGATGTTAAATTTTTCGAGCTTTAGTTTGTGATTTCAATGGTTTTTCTGCAGGTTGATGTTATAGTCA
V D V I V
CGACAACTGGTGGTGTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTA
T T T G G V E E D L I K C L A P T F K G D F S L
CCTGGAGCTTATTTAAGGTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATACTACTG
P G A Y L R S K G L N R I G N L L V P N D N Y C
CAAGTTTGAGGATTGGATCATTCCCATCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGGTATTGCTTT
K F E D W I I P I F D E M L K E Q K E E
ATCTTTCTTTTATATGATTTGAGATGATTCTGTTTGTGCGTCACTAGTGGAGATAGATTTGATTCCTC
TCTTGCATCATTGACTTCGTTGGTGAATCCTTCTTCTCTGGTTTTTCTTGTAGAATGTGTGTGGACTC
N V L W T
CTTCTAAACTGTTAGCACGGCTGGGAAAAGAAATCAACAATGAGAGTTCATACCTTTATTTGGGCATACAG
P S K L L A R L G K E I N N E S S Y L Y W A Y K
GTATCCAAATTTTAACCTTTTGTAGTTTAAATCATCCTGTGAGGAACCTCGGGGATTTAAATTTTCCGCT
TCTTGTGGTGT TTTGTAGATGAATATTCCAGTATTCTGCCAGGGTTAACAGATGGCTCTCTTGGGGATATG
M N I P V F C P G L T D G S L G D M
CTGTATTTTCACTCTTTTCTGACCTCTGGCCTCATCATCGATGTAGTACAAGGTACTTCTTTTACTCAATA
L Y F H S F R T S G L I I D V V Q
AGTCAGTGTGATAAATATTCTGCTACATCTAGTGCAGGAATATTGTAAGTAGTAGTGCAATTGTAGCTTTT
CCAATTCAGCAACGGACTTTACTGTAAAGTTGATATCTAAAGGTTCAAACGGGAGCTAGGAGAATAGCATAG
GGGCATTCTGATTTAGGTTTGGGGCACTGGGTAAAGAGTTAGAGAATAATAATCTTGTAGTTGTTTATCA
AACTCTTTGATGGTTAGTCTCTTGGTAATTTGAATTTTATCACAGTGT TATGGTCTTTGAACCAGTTAAT
GTTTTATGAACAGATATCAGAGCTATGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGAT
D I R A M N G E A V H A N P K K T G M I
AATCCTTGGAGGGGCTTGCCAAAGCACCACATATGTAATGCCAATATGATGCGCAATGGTGCAGATTACG
I L G G G L P K H H I C N A N M M R N G A D Y
CTGTATTTATAAACACCGGGCAAGAATTTGATGGGAGCGACTCGGGTGCACGCCCTGATGAAGCCGTGTCT
A V F I N T G Q E F D G S D S G A R P D E A V S
TGGGGTAAATAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTTAAATTTCTTCACATCCTAATTTATA
W G K I R G S A K T V K V C F L I S S H P N L Y
TCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTTGCAGGTATACTGTGATGCTACCATA
L T Q W F
GCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACCAAACCTGTGAGTCTAAGACTTAAGA
ACTGACTGGTCTGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTTGTATTTTACACTGGAGTGACCATAT
AACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGAATTGTACTTTAGTTTCTCTCAACCT
AAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTGTAGTCAATAATCCTTTGCCTTATAA
AATTATTCAGTTCCAACAACACATTGTGATTCTGTGACAAGTCTCCCGTTGCCTATGTTCACTTCTCTGCG

0975049.12900

Figure 2B

MEDDRVFSVHSTVFKESLESLEGKCDKIEGYDFNQGVDPKLMRSLTTGFGASNLGEAIDVFNQMFVFLKLDWRLADETTV
AEDCSEEEKNPSFRESVKCKIFLGFTSNLVSSGVRDTIRYLVOHHMVDVIVTTTGGVEEDLIKCLAPTFKGDFSLPGAYLRSK
GLNRIGNLLVPNDNYCKFEDWIIPIFDEMLKEQKEENVLWTPSKLLARLGKEINNESSYLYWAYKMNI PVFCPGLTDGSLGDM
LYFHSFRTSGLIIDVVQDIRAMNGEAVHANPKKTGMIILGGGLPKHHICNANMMRNGADYAVFINTGQEFDGSDSGARPDEAV
SWGKIRGSAKTVKVCFLISSHPNLYLTQWF

Figure 2C

GGTGGTGTGAGGAAGATCTCATAAAATGCCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGCTTATTTAAG
GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATAACTACTGCAAGTTTGAGGATTGGATCATTCCCA
TCCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGTGTGGACTCCTTCTAAACTGTTAGCACGGCTGGGAAAA
GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTTAACAGATGG
CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATATCAGAGCTA
TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAGCACACATA
TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAATTTGATGGGAGCGACTC
GGGTGCACGCCCTGATGAAGC

Figure 2D

GGVEEDLIKCLAPTFKGDFSLPGAYLRSKGLNRIGNLLVPNDNYCKFEDWIIPIFDEMLKEQKEENVLWTPSKLLARLGKEIN
NESSYLYWAYKMNI PVFCPGLTDGSLRDMLYFHSFRTSGLIIDVVQDIRAMNGEAVHANPKKTGMIILGGGLPKHHICNANMM
RNGADYAVFINTGQEFDGSDSGARPDE

00527-67052250

Multiple DHS Sequence Alignments of Human, Arabidopsis, Tomato, Yeast, Neurospora(Fungi), and Methanococcus(Archaeobacteria)

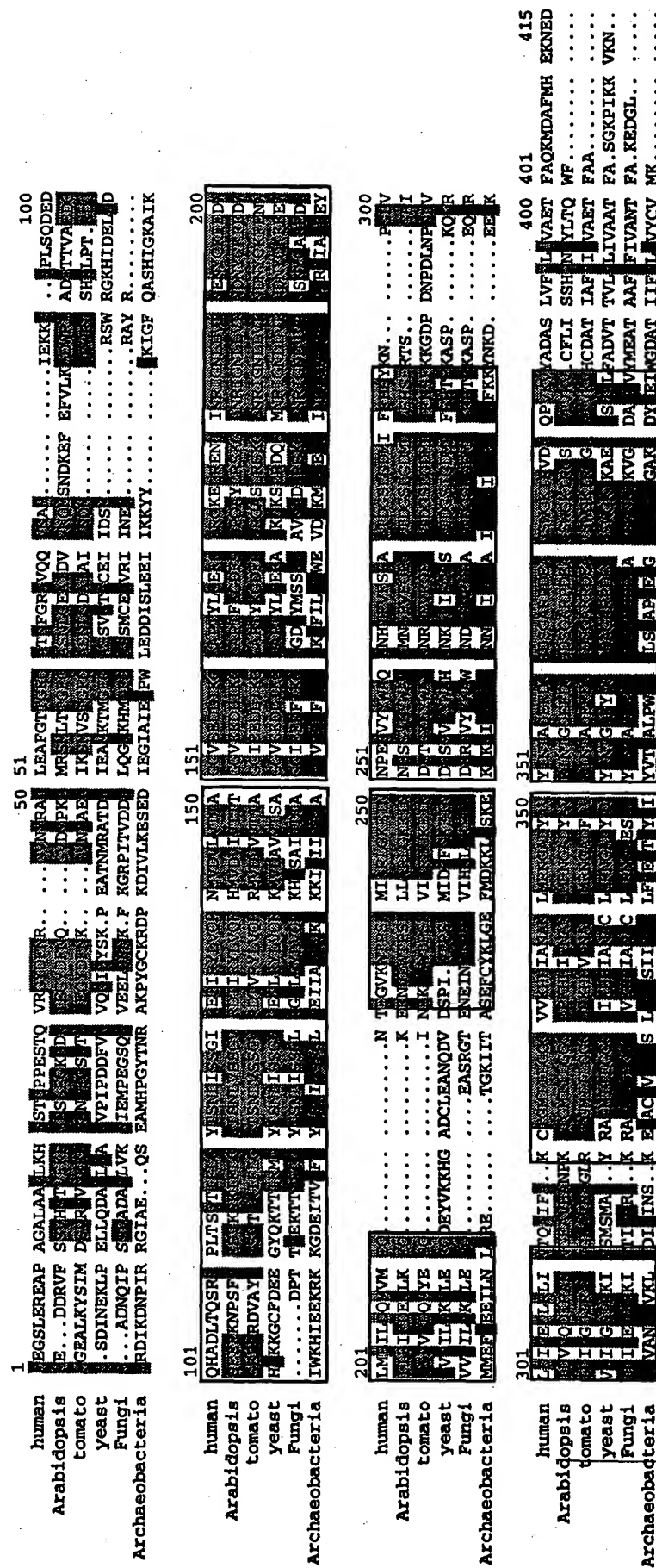
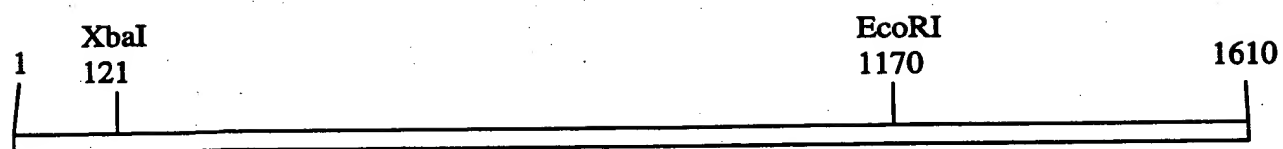


Figure 4



005277-6T052260

Figure 5

Southern Analysis of DHS

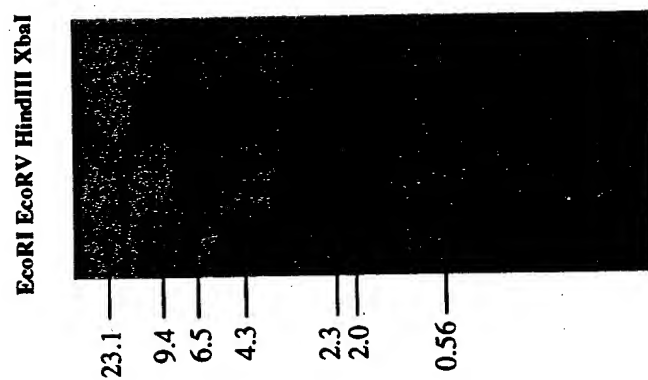


Figure 6

DOCKET# 67052460

Northern Analysis of DHS on Tomato Flowers

Blossom
and
Bud Senescence



RNA



Northern

Figure 7

**Northern Analysis of DHS
on Developmental Stages of**

Tomato Fruit

**Ripe
Breaker Pink (red)**

**Northern
Blot**



Figure 8

Northern Analysis of DHS - 2M Sorbitol treated Tomato Leaves

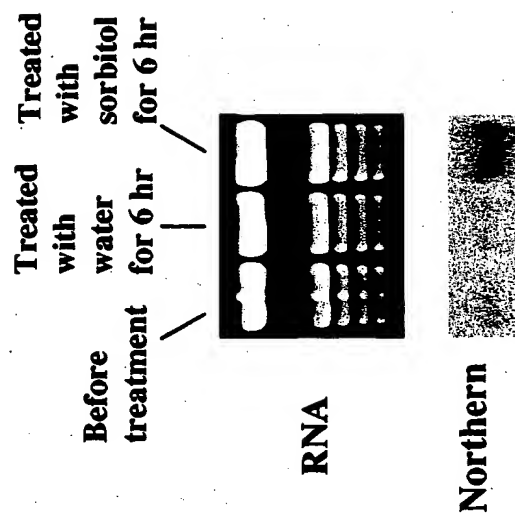
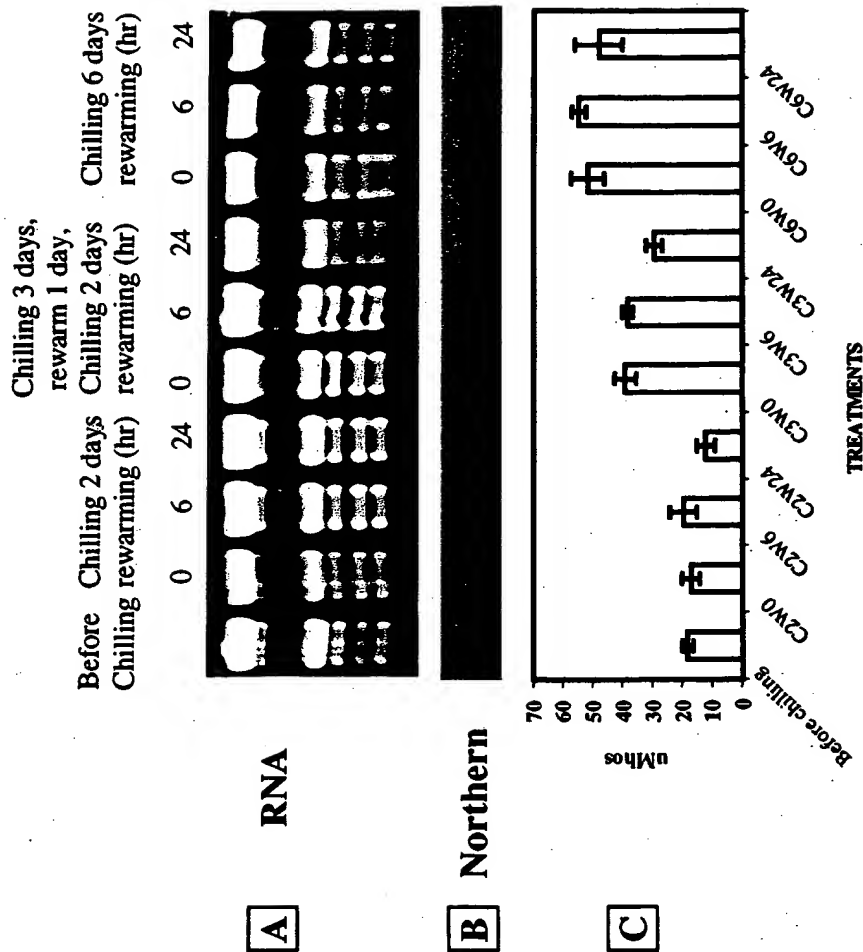


Figure 9

005311" 6T052460

Northern Analysis of DHS Tomato Leaf Chilling Effects



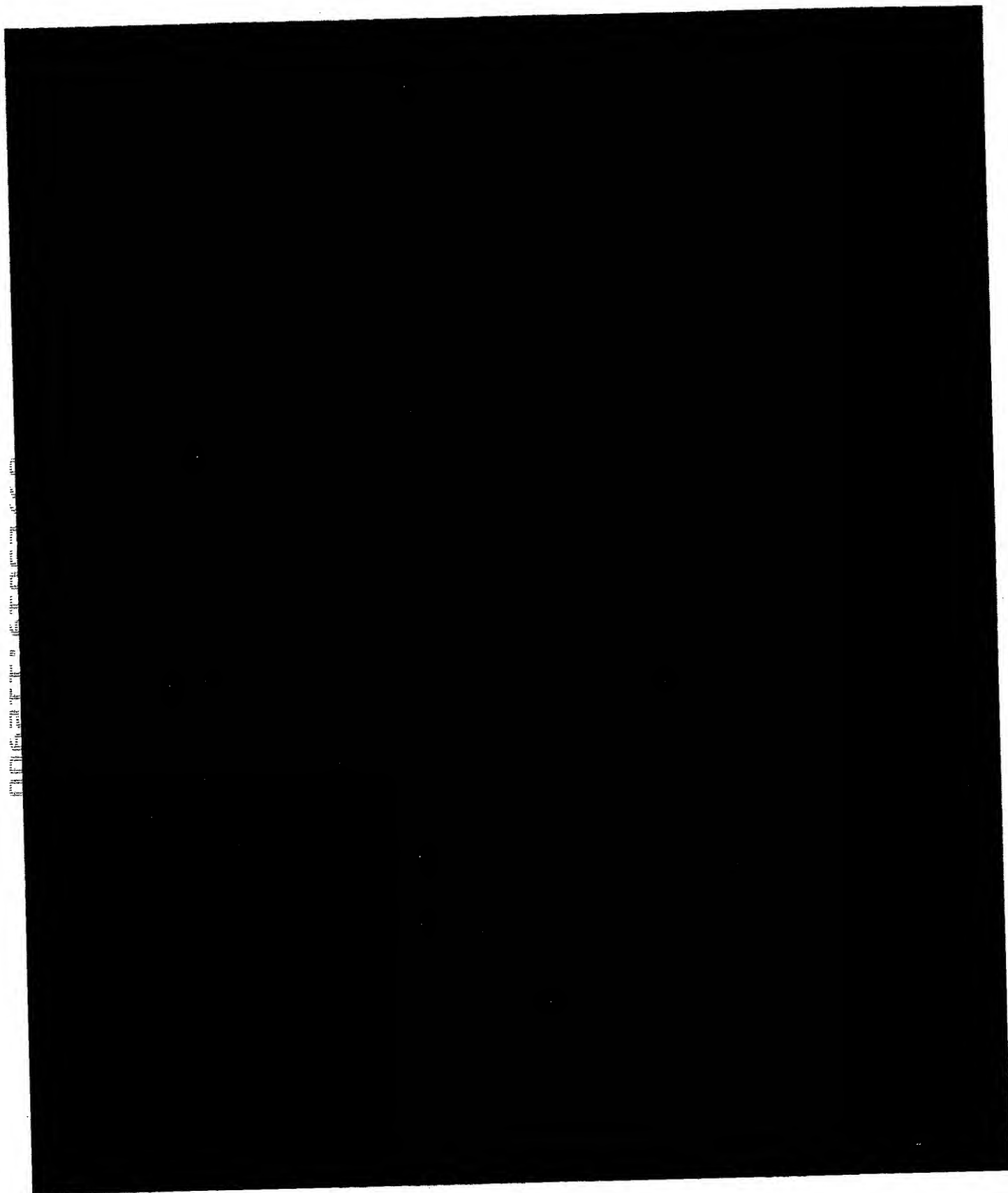


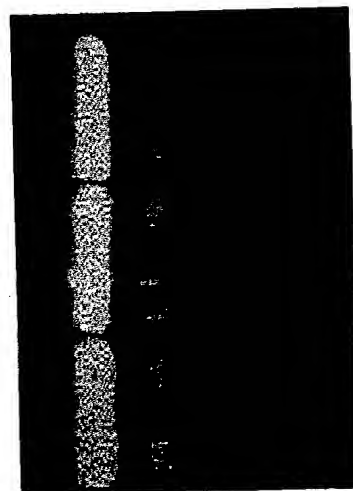
Figure 10

Northern Analysis of WT AT Aging Leaves

Week 5 6 7



Northern Blot



RNA Gel

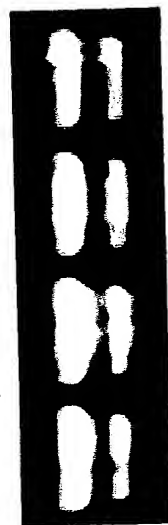
Figure 11

Northern Analysis of Canation Petal (*In Situ*)DHS

Stage I II III IV



Northern Blot



RNA Gel

Figure 12

Tomato if5A Figure 13

AAAGAATCCTAGAGAGAGAAAGGAATCCTAGAGAGAGAAAGCATGTCGGACGAAGAACAC
M S D E E H
CATTTTGAGTCAAAGGCAGATGCTGGTGCCTCAAAAACTTTCCACAGCAAGCTGGAACC
H F E S K A D A G A S K T F P Q Q A G T
ATCCGTAAGAATGGTTACATCGTTATCAAAAGGCCGTCCTGCAAGGTTGTTGAGGTCCTCC
I R K N G Y I V I K G R P C K V V E V S
ACTTCAAAAACCTGAAAACACGGACATGCTAAATGTCACCTTTGTGGCAATTGACATTTTC
T S K T G K H G H A K C H F V A I D I F
AATGGAAGAAACTGGAAGATATCGTTCCGTCCTCCACAATTGTGATGTGCCACATGTT
N G K K L E D I V P S S H N C D V P H V
AACCCTACCGACTATCAGCTGATTGATATCTCTGAAGATGGTTTGTCTCCTCTTACT
N R T D Y Q L I D I S E D G F V S L L T
GAAAGTGAAACACCAAGGATGACCTCAGGCTTCCCAACCGATGAAAAATCTGCTGAAGCAG
E S G N T K D D L R L P T D E N L L K Q
GTTAAAGATGGGTTCCAGGAAGGAAAGGATCTTGTGGTGTCTGTATGTCTGCGATGGGC
V K D G F Q E G K D L V V S V M S A M G
GAAGAGCAGATTAAACGCCGTTAAGGATGTTGGTACCACGAATTAGTTATGTCATGGCAGC
E E Q I N A V K D V G T K N
ATAATCACTGCCAAAGCTTTAAGACATTATCATATCCTAATGTGGTACTTTGATATCACT
AGATTATAAACTGTGTTATTTGCACTGTTCAAAACAAAAGAAAGAACTGCTGTTATGG
CTAGAGAAAAGTATTGGCTTTGAGCTTTTGACAGCACAGTTGAACATATGTGAAAATTCTAC
TTTTTTTTTTTTGGGTAAATACTGCTCGTTTAAATGTTTGCAAAAAAAAATAAAAAA

764 bps, not including Poly(A) tail; 160 amino acids

Figure 13

Arabi dopsi s F5A

CTGTTACCAAAAAATCTGTACCGCAAAATCCTCGTCGAAGCTCGCTGCTCAACCATGTC
M S
CGACGAGGAGCATCACTTTGAGTCCAGTGACGCCGGAGCGTCCAAAAACCTACCCCTCAACA
D E E H H F E S S D A G A S K T Y P Q Q
AGCTGGAACCATCCGTAAGAATGGTTACATCGTCATCAAAAATCGTCCCTGCAAGGTTGT
A G T I R K N G Y I V I K N R P C K V V
TGAGGTTTCAACCTCGAAGACTGGCAAGCATGGTCATGCTAAATGTCAATTTGTAGCTAT
E V S T S K T G K H G H A K C H F V A I
TGATATCTTACCAGCAAGAACTCGAAGATATTGTTCTTCTTCCCACAATTGTGATGT
D I F T S K K L E D I V P S S H N C D V
TCCTCATGTCAACCGTACTGATTATATCAGCTGATGACATTTCTGAAGATGGATATGTCAG
P H V N R T D Y Q L I D I S E D G Y V S
TTTGTGACTGATAACGGTAGTACCAAGGATGACCTTAAGCTCCCTAATGATGACACTCT
L L T D N G S T K D D L K L P N D D T L
GCTCCAACAGATCAAGAGTGGGTTTGATGATGAAAAGATCTAGTGGTGAGTGAATGTC
L Q Q I K S G F D D G K D L V V S V M S
AGCTATGGGAGAGGAACAGATCAATGCTCTTAAGGACATCGGTCCCCAAGTGAGACTAACA
A M G E E Q I N A L K D I G P K
AAGCCTCCCCCTTTGTTATGAGATTTCTTCTTCTGTAGGCTTCCATTACTCGTCGGAGA
TTATCTTGTGTTTGGGTTACTCCTATTTTGGATATTTAAACTTTTGTAAATAATGCCATC
TTCTTCAACCTTTTCCCTCTAGATGGTGTATTATACCTTCTTCT

754 bps, not including Poly(A) tail; 158 amino acids

Figure 15

Northern Analysis of WT AT DHS and F5A

Aging Leaves

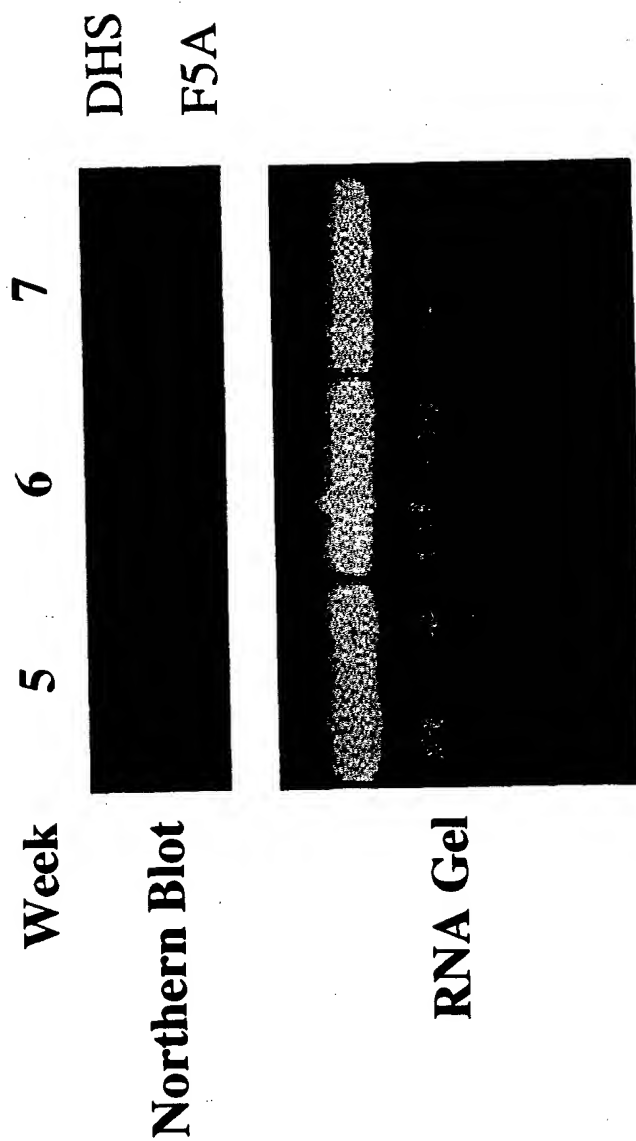


Figure 16

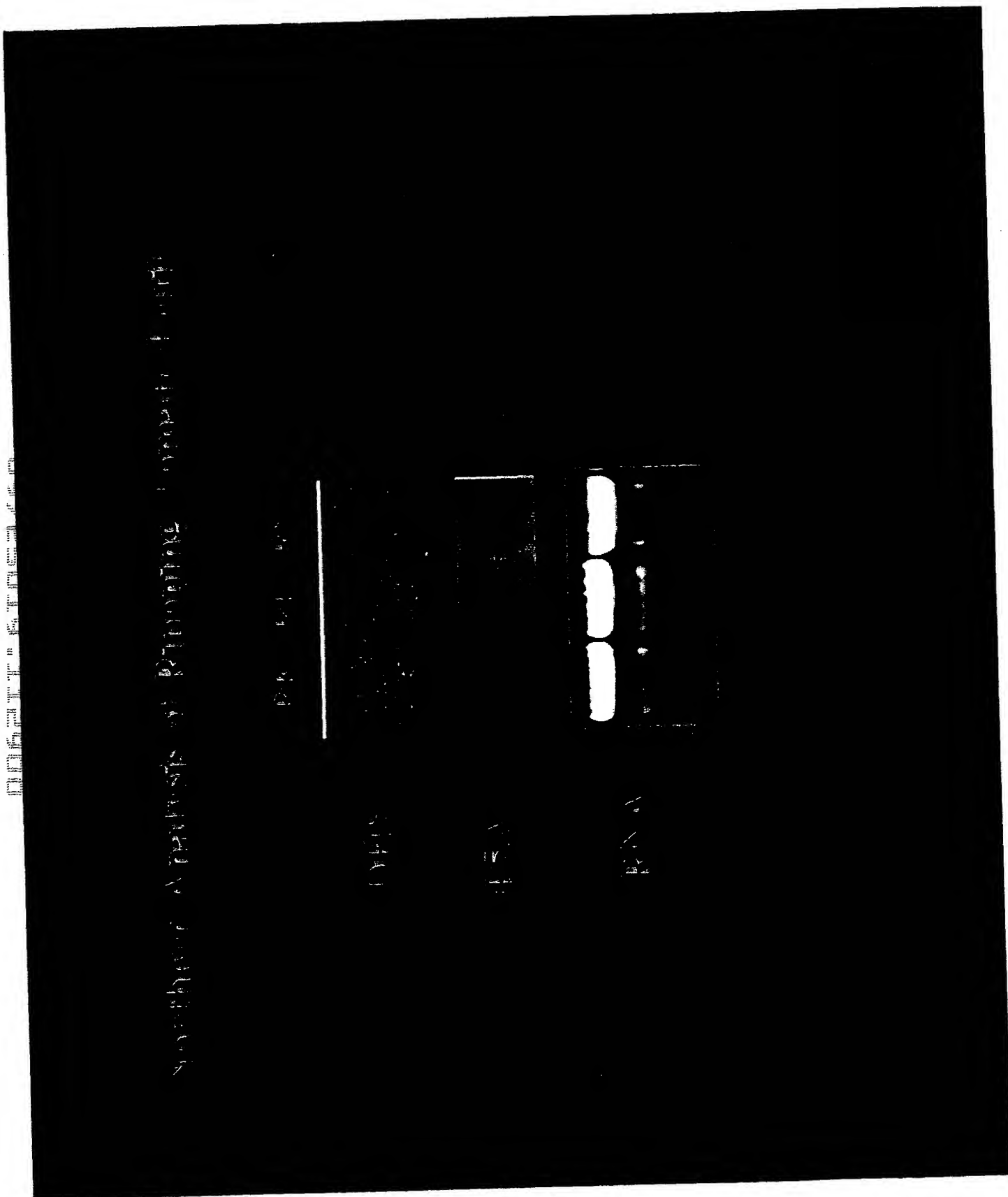


Figure 17

SECRET - SECURITY INFORMATION

SECRET - SECURITY INFORMATION

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SECRET - SECURITY INFORMATION

SECRET

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SECRET



Figure 18

1890-1891

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 CHICAGO
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Figure 20

3.1 Weeks

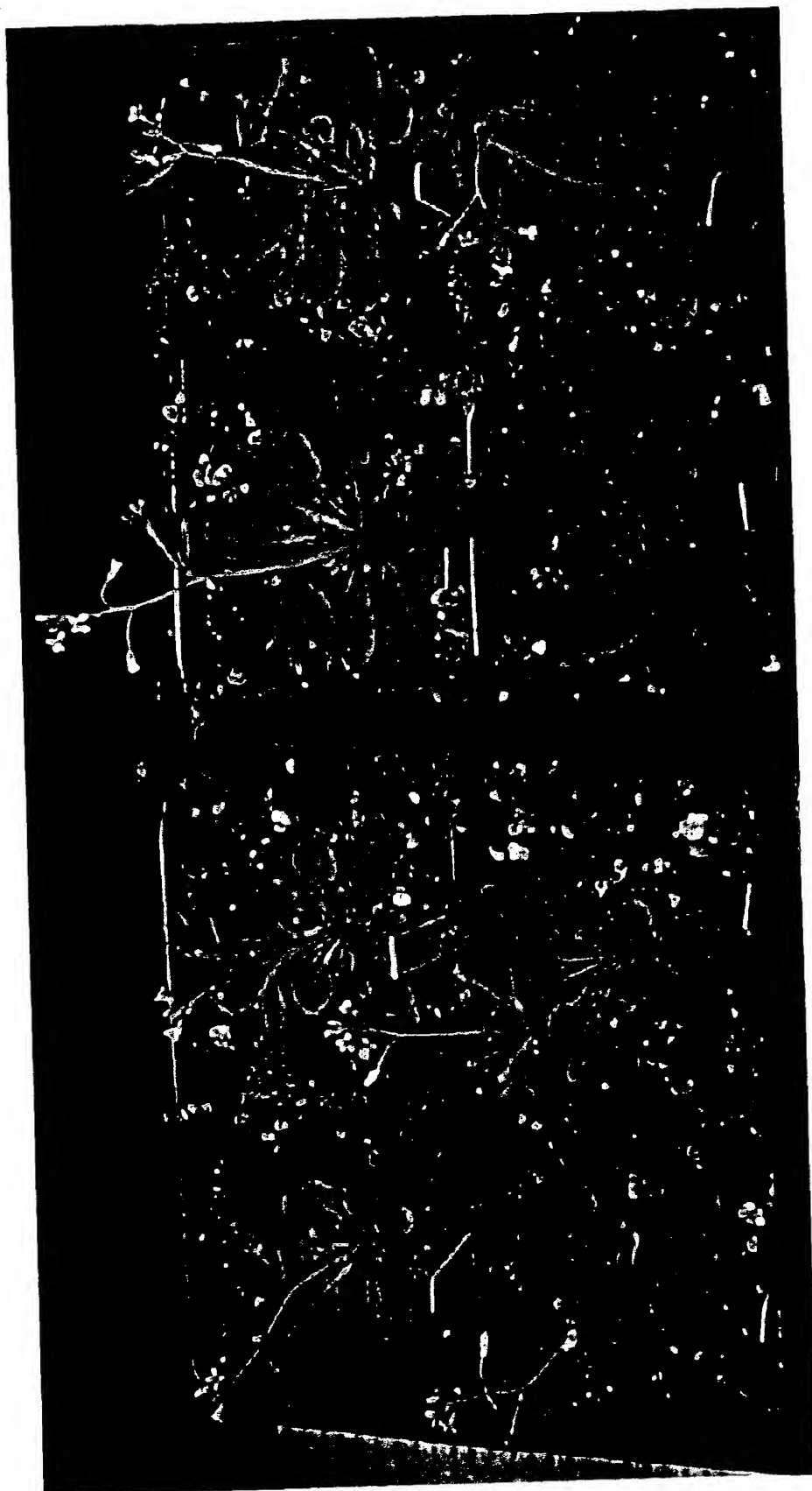


Wild-Type

α - 3'DHS #3

Figure 21

4.6 Weeks



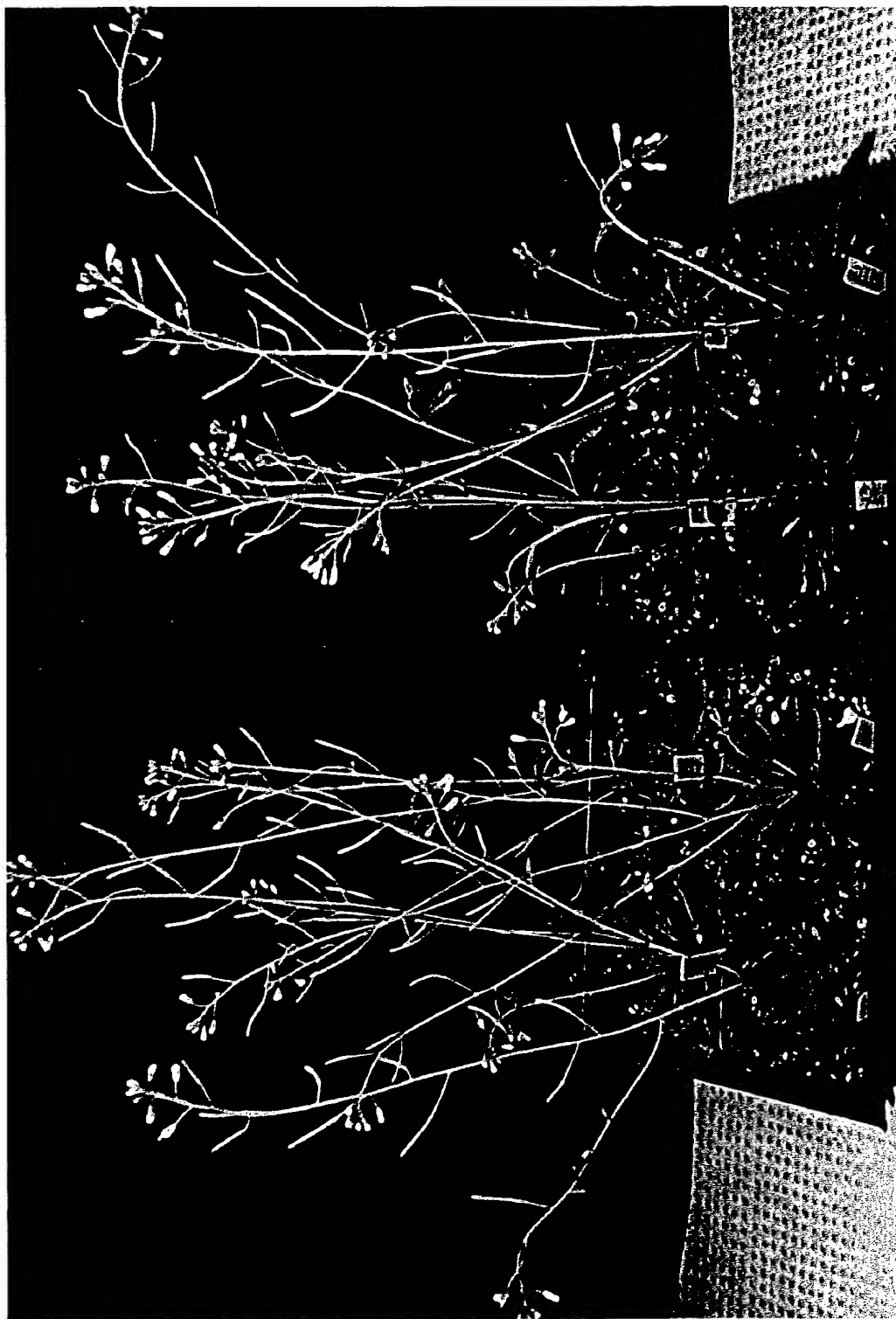
α - 3'DHS #3

Wild-Type

Figure 22

00627T 6T052260

5.6 Weeks



Wild-Type **α - 3'DHS # 7**

Figure 23

006277 5 TDS2260

6.1 Weeks



α - 3'DHS #7

Wild-Type

Figure 24

Seed Volume of Transgenic antisense-3'DHS plants

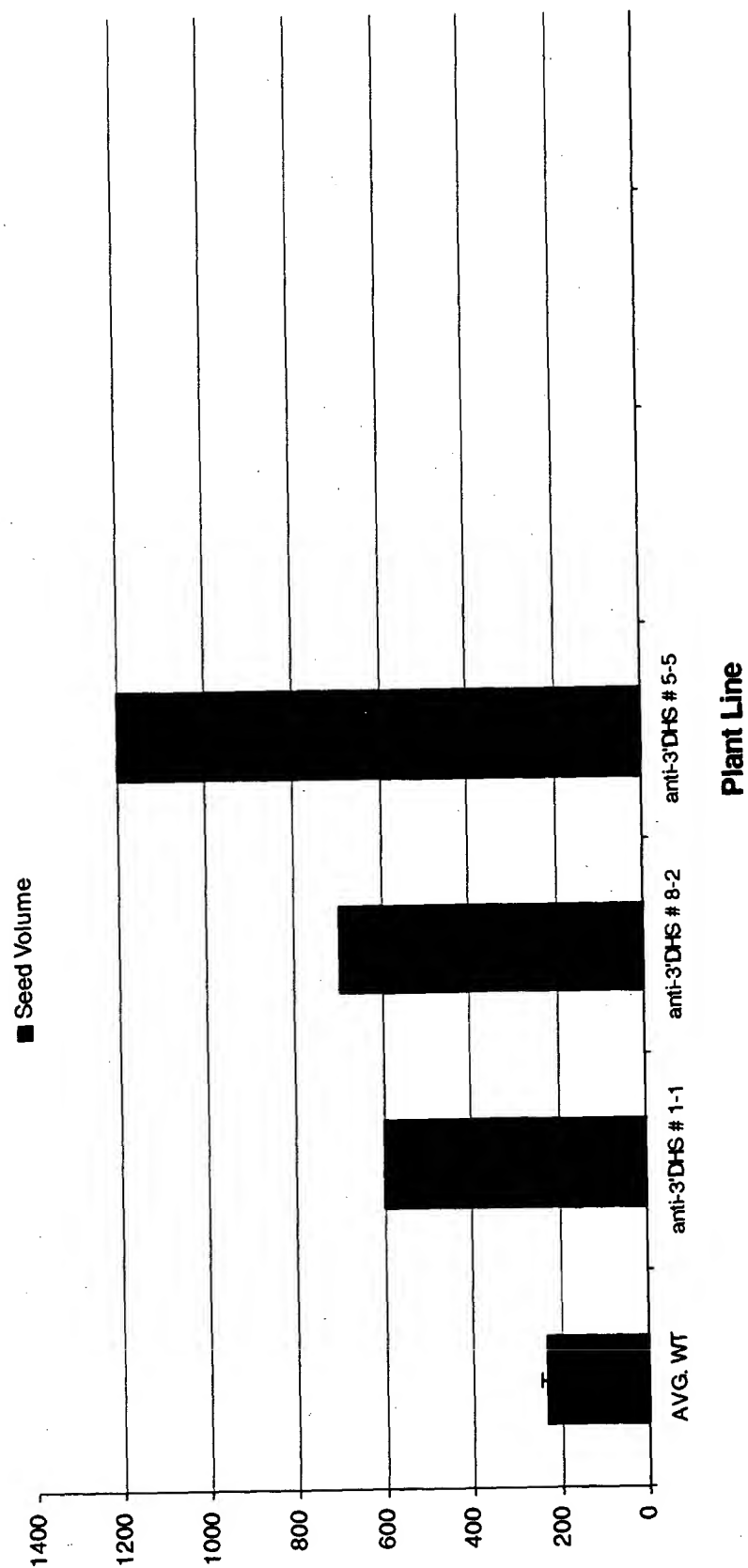


Figure 25

005211 61092260

18 Days

Anti 3'-DHS

Wild type

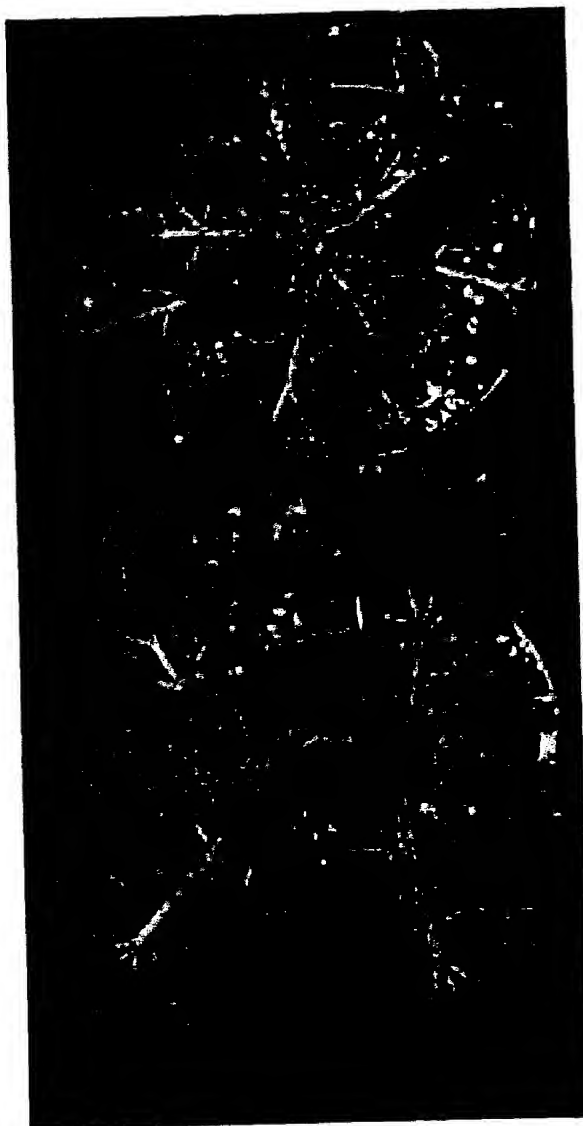


Figure 26

005211-6T052460

32 Days

Anti 3'-DHS

Wild type



Figure 27

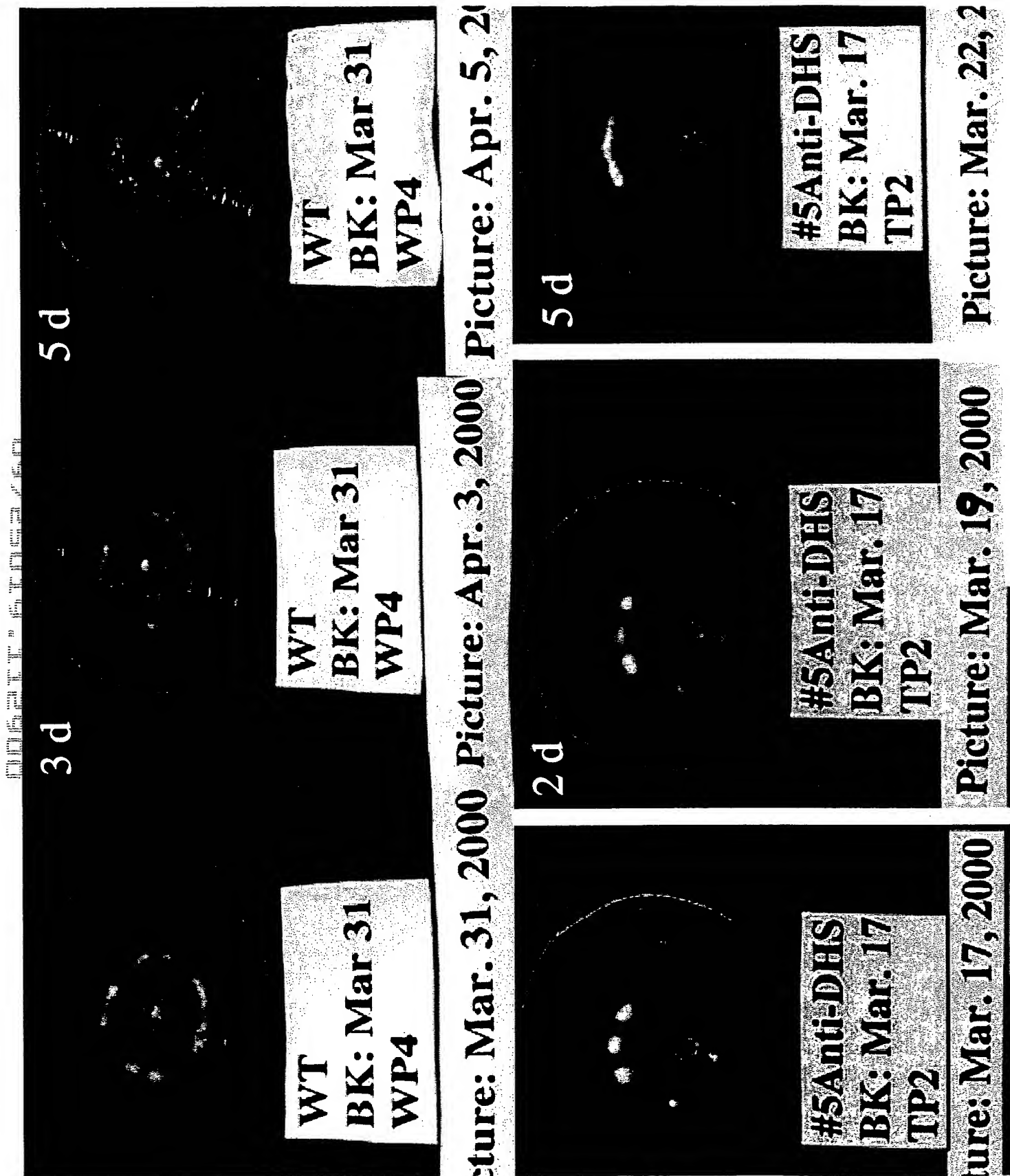


Figure 28

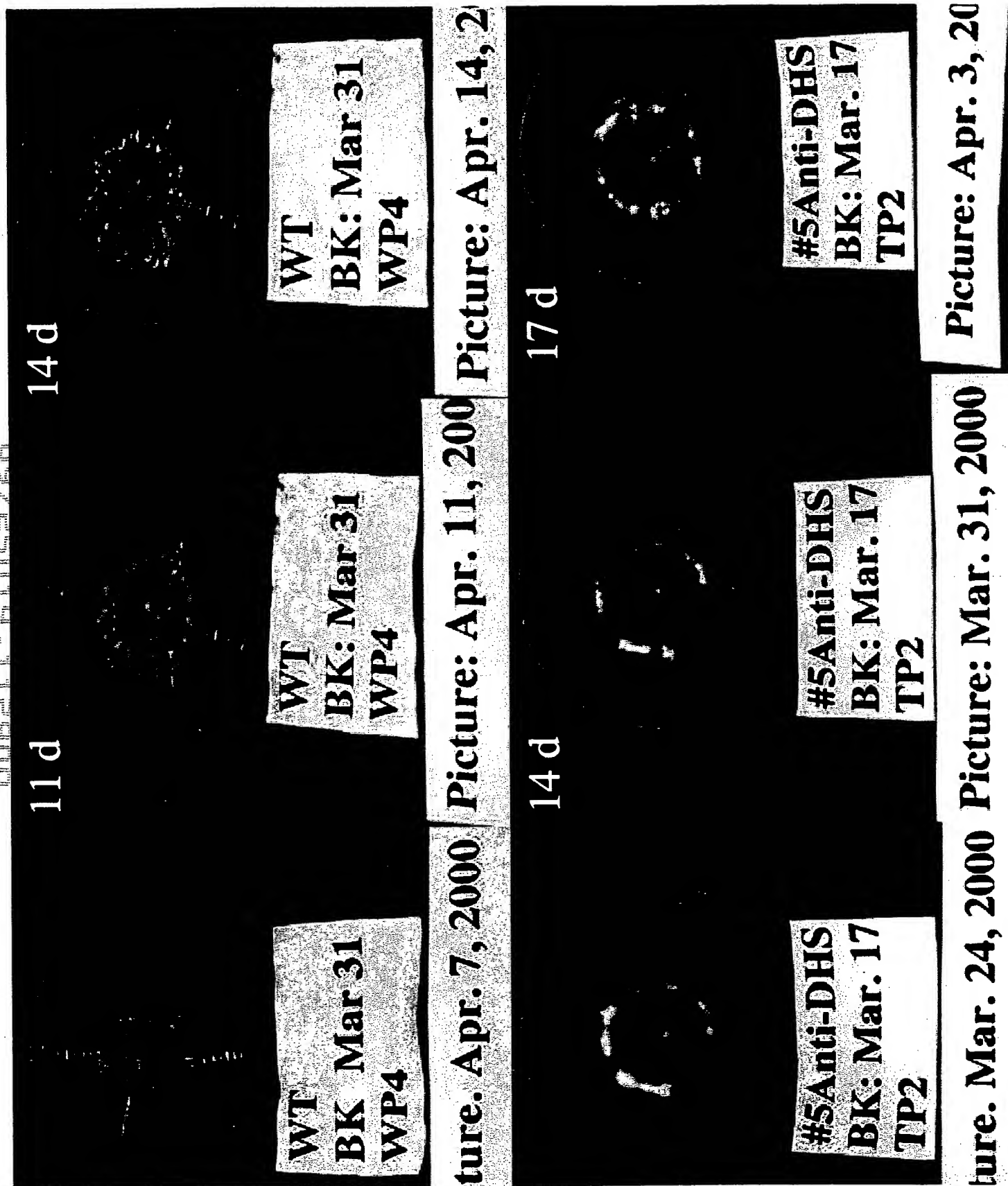
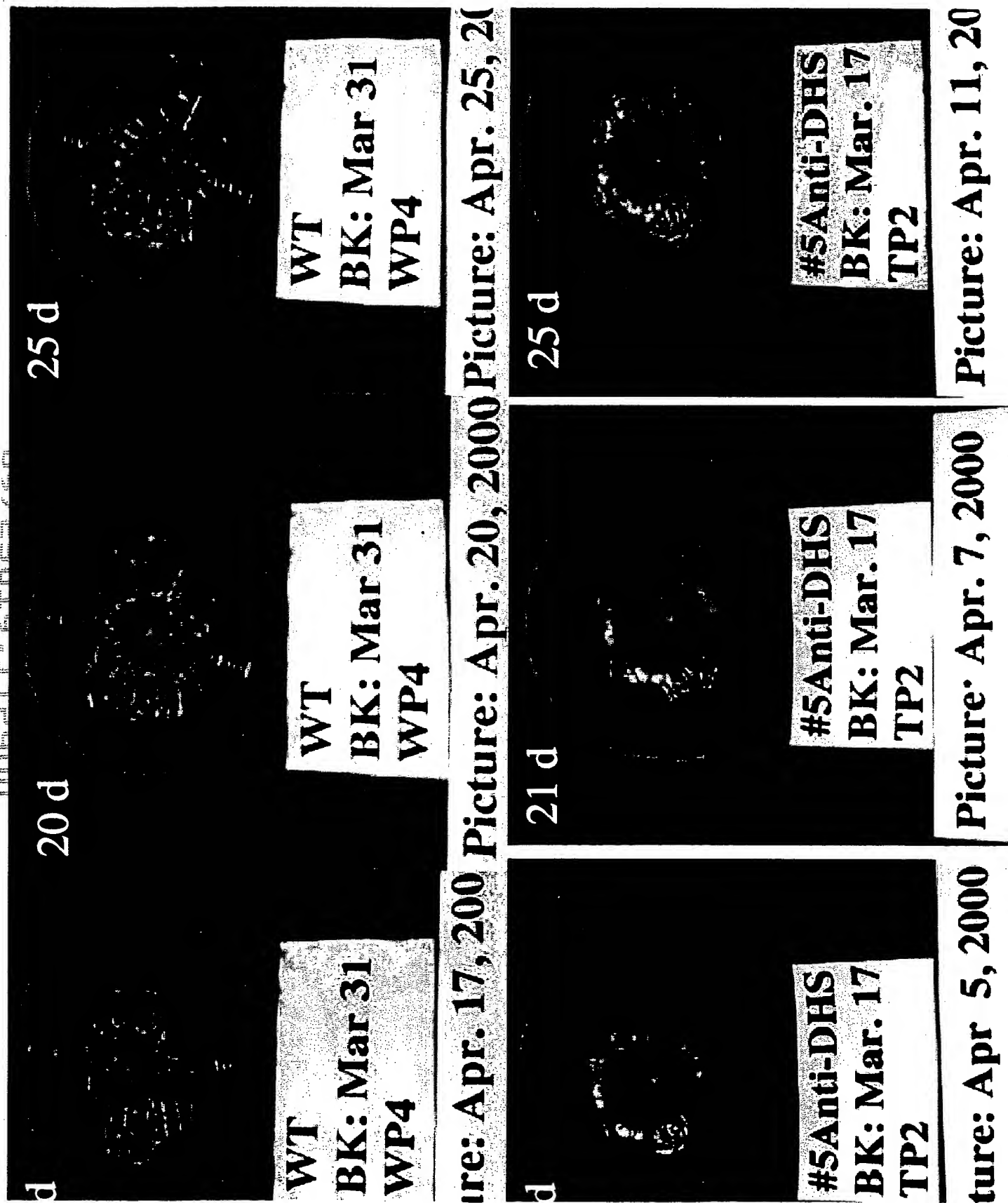


Figure 29

Figure 30



9

WT
BK: Mar 31
WP4

WT
BK: Mar 31
WP4

Picture: May 1, 2000

Lecture: Apr. 28, 200

31d

34 d

#5Anti-DHS
BK: Mar. 17
TP2

#5Anti-DHS
BK: Mar 17
TP2

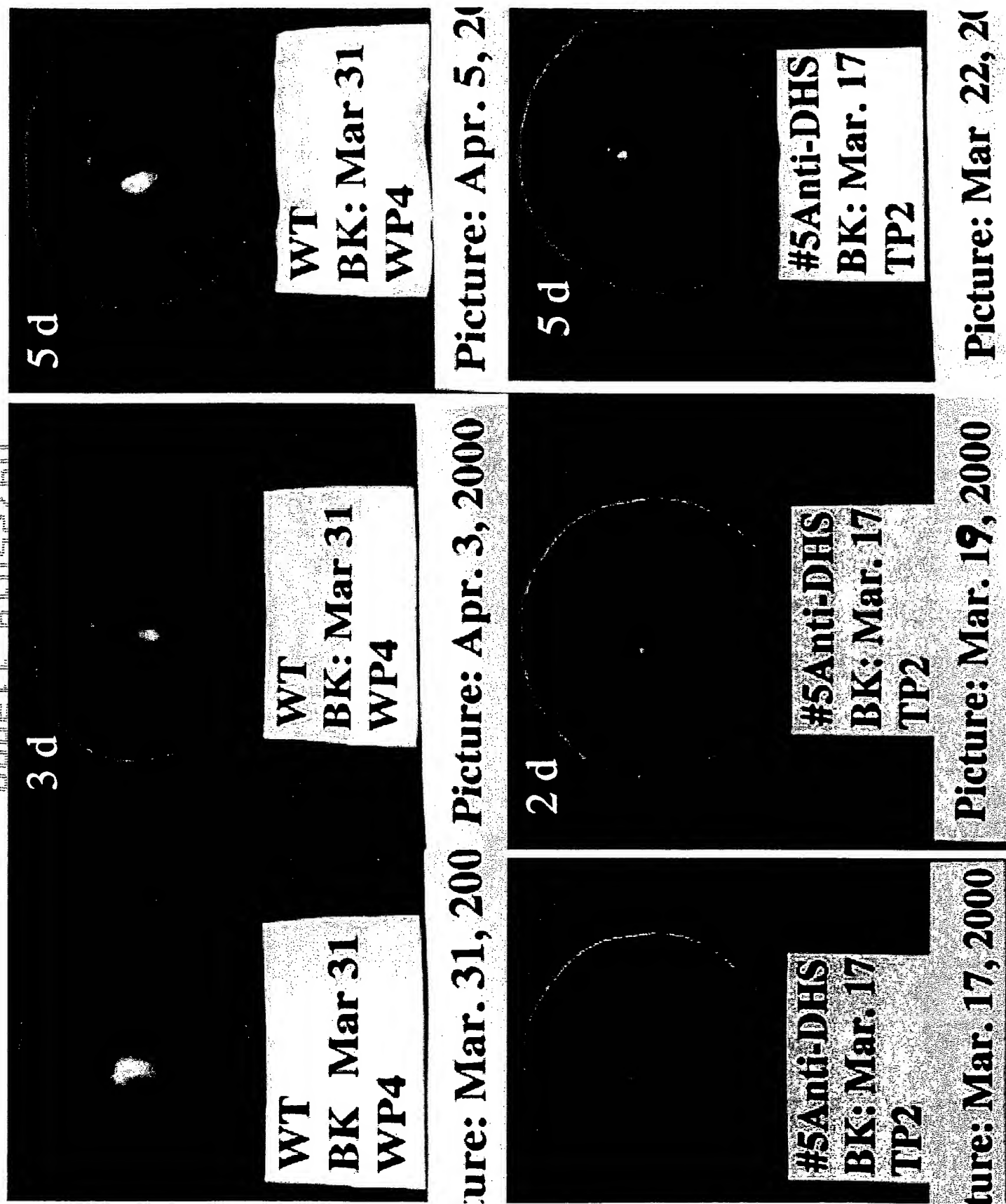
Picture: Apr. 17, 2000

ture. Apr. 14, 2000

Picture· Apr. 20, 20

Figure 31

Figure 32



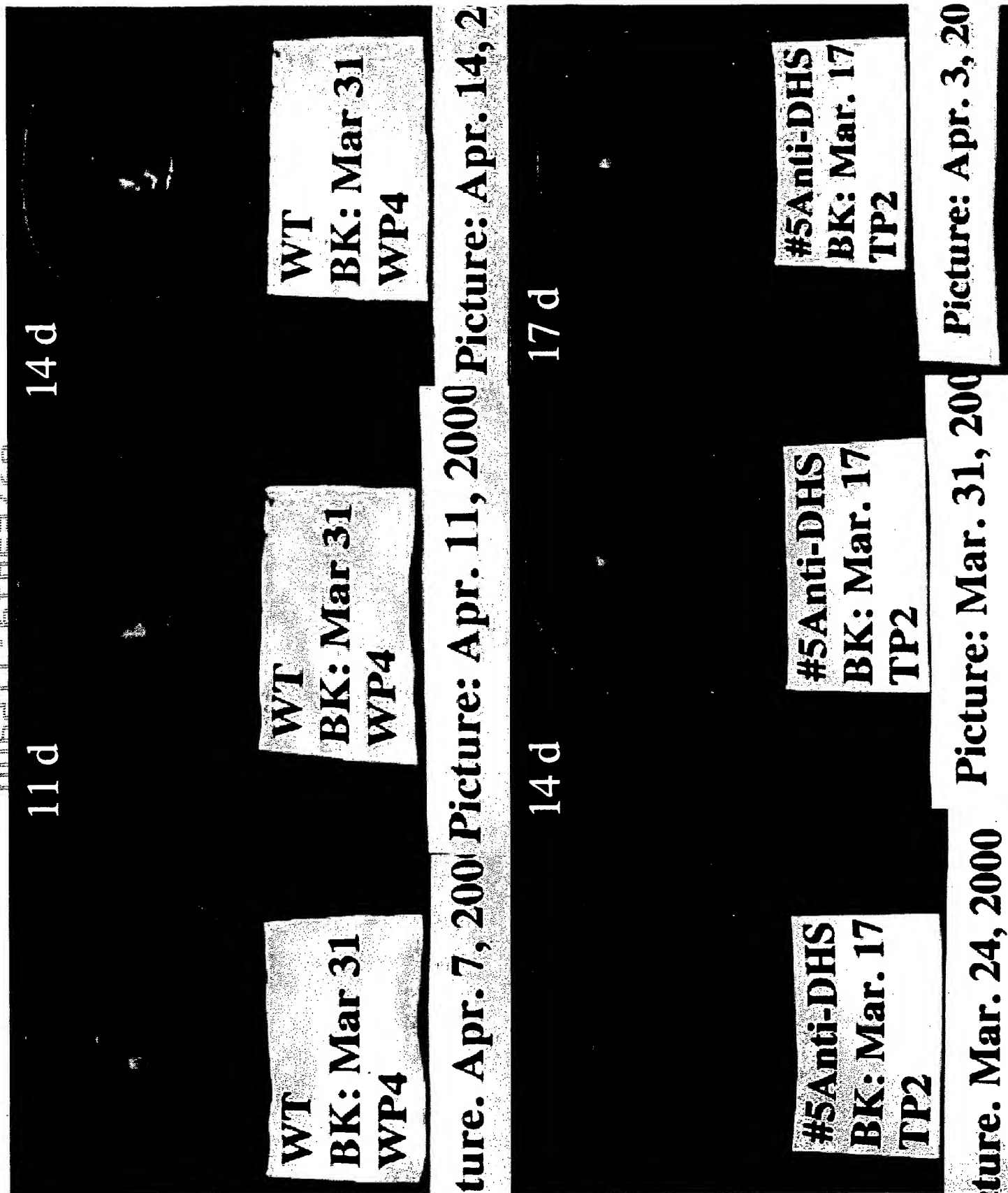


Figure 33

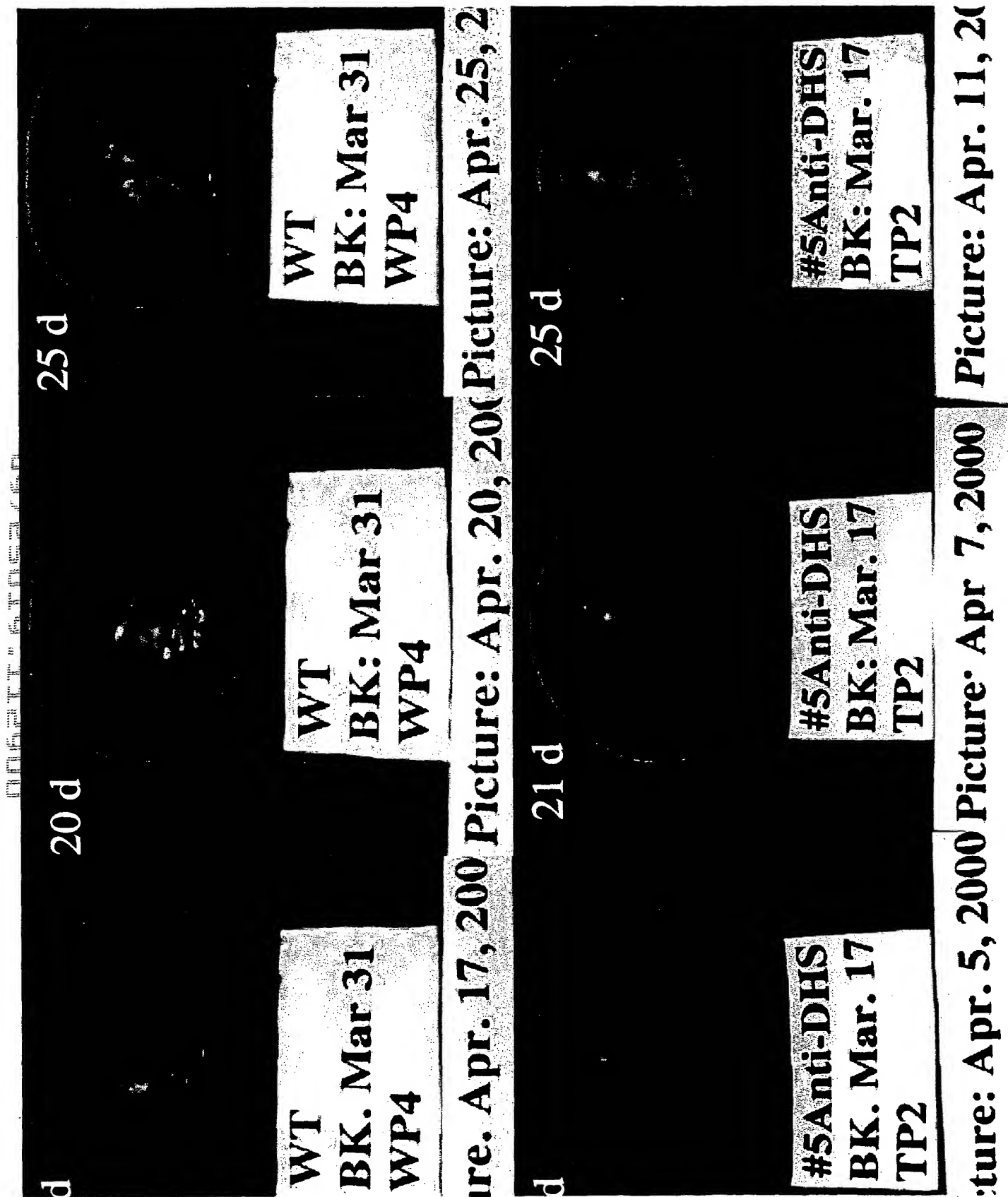
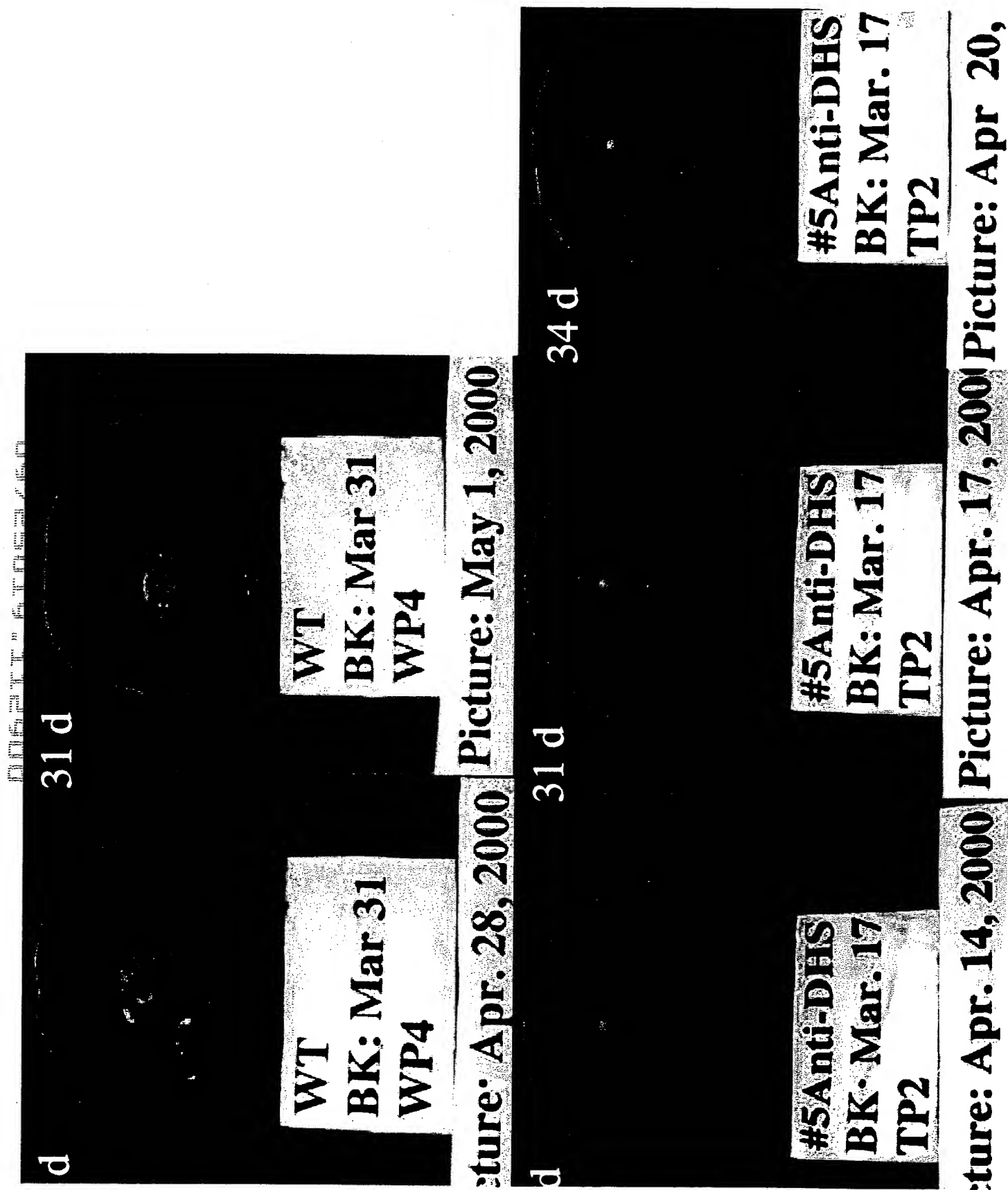


Figure 34

Figure 35



Arabidopsis 3'-end DHS for antisense

Nucleotide and derived amino acid sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT
A R P D E A V S W G K I R G S A K T V K V C F

TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT
L I S S H P N L Y L T Q W F

GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT
TGATTTTACACTGGAGTGACCATATAAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTG
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAGTTCCAACAAAAAAAAAAAAAAAAAAAA

Nucleotide sequence

TGCACGCCCTGATGAAGCTGTGTCTTGGGGTAAAATTAGGGGTTCTGCTAAAACCGTTAAGGTCTGCTTTT
TAATTTCTTCACATCCTAATTTATATCTCACTCAGTGGTTTTGAGTACATATTTAATATTGGATCATTCTT
GCAGGTATACTGTGATGCTACCATAGCCTTCCCATTGTTGGTTGCAGAAACATTTGCCACAAAGAGAGACC
AAACCTGTGAGTCTAAGACTTAAGAACTGACTGGTCGTTTTGGCCATGGATTCTTAAAGATCGTTGCTTTT
TGATTTTACACTGGAGTGACCATATAAACACTCCACATTGATGTGGCTGTGACGCGAATTGTCTTCTTGCGA
ATTGTACTTTAGTTTCTCTCAACCTAAAATGATTTGCAGATTGTGTTTTCGTTTAAAACACAAGAGTCTTG
TAGTCAATAATCCTTTGCCTTATAAAATTATTCAGTTCCAACAAAAAAAAAAAAAAAAAAAA

ARPDEAVSWGKIRGSAKTVKVCFLISSHPNLYLTQWF

Figure 36

Tomato 3'-end-Deoxyhupsine synthase used for antisense

Nucleotide and derived amino acid sequence

GGTGCTCGTCCTGATGAAGCTGTATCATGGGGAAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCAAC
G A R P D E A V S W G K I R G G A K T V K V H C D A T

CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTCTCCCAGATAAGGTGCCAAGTTTGAA
I A F P I L V A E T F A A K S K E F S Q I R C Q V

CATTGAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCAACCTGCTAGTGTGCAGCACCATTTA
TTCTGCAAAACTGACTAGAGAGCAGGGTATATTCCTCTACCCCGAGTTAGACGACATCCTGTATGGTTCAAATTAATTAT
TTTTCTCCCCTTCACACCATGTTATTTAGTTCTCTTCTCTTCGAAAAGTGAAGAGCTTAGATGTTTCATAGGTTTTGAATT
ATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCCTTGTAATGAGATTTTGGGTGTGT
TTGATACCAAGGAAAAATGTTTATTTGGAAAACAATTGGATTTTAAATTTAAAAAAAATTGNTTAAAAAAAAAAAAAA

Nucleotide sequence

GGTGCTCGTCCTGATGAAGCTGTATCATGGGGAAAAGATACGTGGTGGTGCCAAGACTGTGAAGGTGCATTGTGATGCAAC
CATTGCATTTCCCATATTAGTAGCTGAGACATTTGCAGCTAAGAGTAAGGAATTC

TCCCAGATAAGGTGCCAAGTTTGAACATTGAGGAAGCTGTCCTTCCGACCACACATATGAATTGCTAGCTTTTGAAGCCA
ACTTGCTAGTGTGCAGCACCATTATTCTGCAAAACTGACTAGAGAGCAGGGTATATTCCTCTACCCCGAGTTAGACGAC
ATCCTGTATGGTTCAAATTAATTATTTTCTCCCCTTCACACCATGTTATTTAGTTCTCTTCTCTTCGAAAGTGAAGAG
CTTAGATGTTTCATAGGTTTTGAATTATGTTGGAGGTTGGTGATAACTGACTAGTCCTCTTACCATATAGATAATGTATCC
TTGTAATGAGATTTTGGGTGTGTTTGATACCAAGGAAAAATGTTTATTTGGAAAACAATTGGATTTTAAATTTAAAAA
AAATTGNTTAAAAAAAAAAAAAA

Figure 37

600 bp Arabidopsis Deoxyhypusine Synthase Probe

Primer1 (underlined)

GGTGGTGTGAGGAAGATCTCATAAAATGCCTTGCACCTACATTTAAAGGTGATTTCTCTCTACCTGGAGC
TTATTTAAG
G G V E E D L I K C L A P T F K G D F S L P G A
Y L R
GTCAAAGGGATTGAACCGAATTGGGAATTTGCTGGTTCCTAATGATAACTACTGCAAGTTTGAGGATTGGA
TCATTCCCA
S K G L N R I G N L L V P N D N Y C K F E D W I
I P
TCTTTGACGAGATGTTGAAGGAACAGAAAGAAGAGAATGTGTTGTGGACTCCTTCTAAACTGTTAGCACGG
CTGGGAAAA
I F D E M L K E Q K E E N V L W T P S K L L A R
L G K
GAAATCAACAATGAGAGTTCATACCTTTATTGGGCATACAAGATGAATATTCCAGTATTCTGCCCAGGGTT
AACAGATGG
E I N N E S S Y L Y W A Y K M N I P V F C P G L
T D G
CTCTCTTAGGGATATGCTGTATTTTCACTCTTTTCGTACCTCTGGCCTCATCATCGATGTAGTACAAGATA
TCAGAGCTA

S L R D M L Y F H S F R T S G L I I D V V Q D I
R A
TGAACGGCGAAGCTGTCCATGCAAATCCTAAAAAGACAGGGATGATAATCCTTGGAGGGGGCTTGCCAAAG
CACCACATA
M N G E A V H A N P K K T G M I I L G G G L P K
H H I
TGTAATGCCAATATGATGCGCAATGGTGCAGATTACGCTGTATTTATAAACACCGGGCAAGAATTTGATGG
GAGCGACTC
C N A N M M R N G A D Y A V F I N T G Q E F D G
S D S

GGGTGCACGCCCTGATGAAGC

G A R P D E

Primer 2 (underlined)

483 bp Carnation Deoxyhypusine Synthase Probe

GAAGATCCATCAAGTGCCTTGCACCCACTTTCAAAGGCGATTTTGCCTTACCAGGAGCTCAATTACGCTCC
AAAGGGT
R R S I K C L A P T F K G D F A L P G A Q L R S
K G

TGAATCGAATTGGTAATCTGTTGGTTCCGAATGATACTACTGTAAATTTGAGGATTGGATCATTCCAATT
TTAGATA
L N R I G N L L V P N D N Y C K F E D W I I P I
L D

AGATGTTGGAAGAGCAAATTTTCAGAGAAAATCTTATGGACACCATCGAAGTTGATTGGTCGATTAGGAAGA
GAAATAA
K M L E E Q I S E K I L W T P S K L I G R L G R
E I

ACGATGAGAGTTCATACCTTTACTGGGCCTTCAAGAACAATATTCCAGTATTTTGCCCGAGTTTAAACAGAC
GGCTCAC
N D E S S Y L Y W A F K N N I P V F C P G L T D
G S

TCGGAGACATGCTATATTTTCATTCTTTTCGCAATCCGGGTTTAATCATCGATGTTGTGCAAGATATAAGA
GCAGTAA

L G D M L Y F H S F R N P G L I I D V V Q D I R
A V

ATGGCGAGGCTGTGCACGCAGCGCCTAGGAAAACAGGCATGATTATACTCGGTGGAGGGTTGCCTAAGCAC
CACATCT
N G E A V H A A P R K T G M I I L G G G L P K H
H I

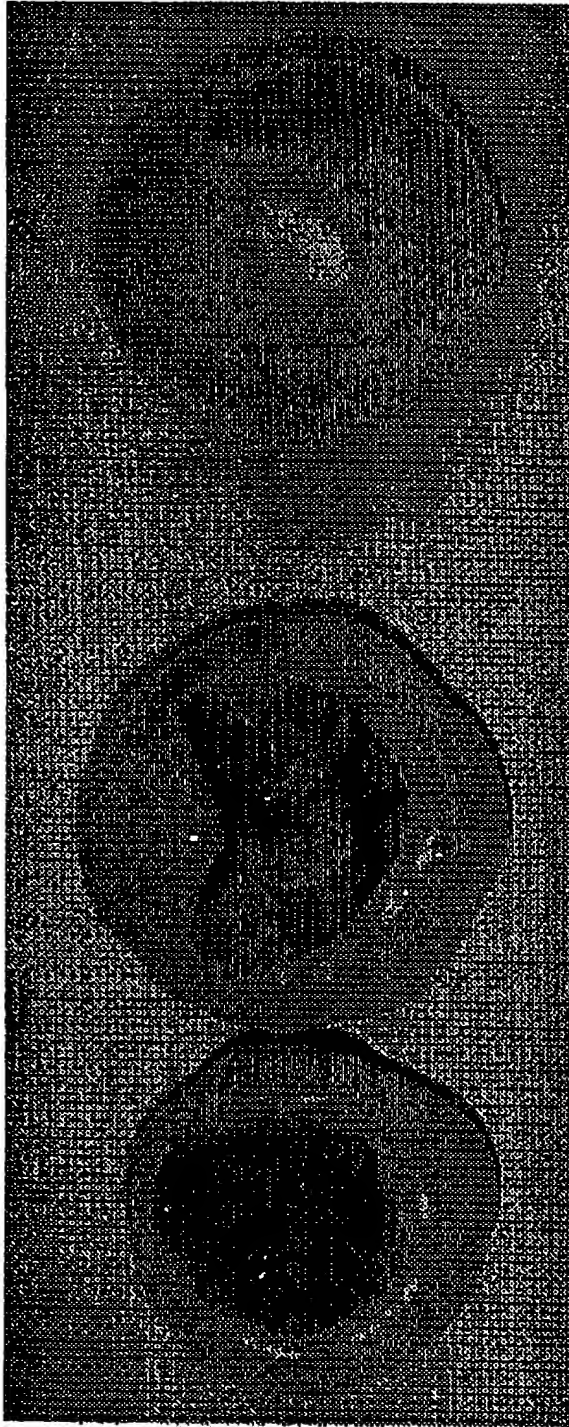
GCAACGCAAACATGATGAGAAATGGCGCCGATTATGCTGTTTTTCATCAACACCG
C N A N M M R N G A D Y A V F I N T

A full-length cDNA clone was obtained by screening a carnation senescing petal cDNA library with this probe.

Figure 39

Figure

40A



Blossom end rot

Normal

Figure

40 B

